

HQ Air Force Center for Environmental Excellence

MODEL WORK PLAN



Version 1.0

July 1996

Acknowledgments

The Air Force Center for Environmental Excellence (AFCEE) wishes to thank the following AFCEE division and individuals for their efforts in the preparation of this document: The AFCEE Environmental Restoration Consultant Operations Division; Lt. Col. Darrel R. Cornell, Chief, Consultant Operations Division; Major Eric A. Banks, Chemistry Leader; Ms. Beth Garland, Chemist; and Dr. R. William Kessler, Chemist.

<i>Do not include this page in the final version of the WP.</i>

INSTRUCTIONS FOR USE OF MODEL WP

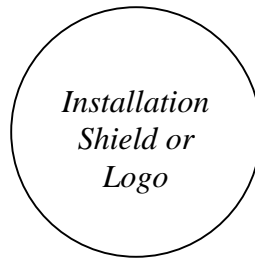
This document, *Air Force Center for Environmental Excellence Model Work Plan (WP)*, is a template. The model WP identifies the tasks to be accomplished for a specific project. Sections of this model WP contains boxed instructions, *in italicized text*, which directs the Installation Restoration Program (IRP) contractor to fill in the site-specific information. *The contractor must use an italicized font for all contractor input to all draft WPs*, however, non-italicized text shall be used in the final version of the WP. The model WP is furnished to the contractors in an electronic format. The contractors are required to follow the boxed instructions for each section and include site-specific information. Once this information has been completed, the boxed instructions should be deleted. In this model WP, all header information and page numbers in the table of contents, list of figures, list of tables, and body of the plan are presented as boxed instructions. The correct information and page numbers must be inserted by the contractor in their final version. All standard text and tables (not the boxed instructions) in the model WP shall remain as provided in the final site-specific WP.

The preparer, when requested to provide a citation to the field sampling plan, should also provide the revision number and identify whether the document is a final or draft version. Document control of the WP will be provided by completion of the document control header located on each page following the title and approval sheets. The preparer will complete each of these headers to ensure current information is available to all project participants.

<i>Do not include this page in the final version of the WP.</i>

Do not include this box in the final version.

Provide a title page in the following format:



FINAL -or- DRAFT

WORK PLAN

Prepared for:

*Name the work effort (e.g., OU2 Site Characterization)
Name the Air Force Installation*

*Contract No.
Delivery Order No.*

revision, month, year

PREFACE

The prime contractor shall describe, the nature of the work covered in the Work Plan (WP), the organization, people involved, and the time period for the WP. It shall include: (1) purpose of the project, (2) professional responsibilities, roles and phone numbers of contractor personnel, (3) acknowledgments, (4) the period of work and, (5) the Contracting Officer's Representative (COR).

LIST OF ACRONYMS AND ABBREVIATIONS

AFCEE	Air Force Center for Environmental Excellence
ARAR	Applicable Or Relevant And Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COR	Contracting Officer's Representative
DEQPPM	Defense Environmental Quality Program Policy Memorandum
DoD	Department of Defense
EPA	Environmental Protection Agency
FSP	Field Sampling Plan
IRP	Installation Restoration Program
NCP	National Contingency Plan
QA/QC	Quality Assurance/ Quality Control
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
SARA	Superfund Amendments and Reauthorization Act
SOW	Statement Of Work
WP	Work Plan

Add other acronyms and abbreviations used.

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1.0 INTRODUCTION

1.1 THE U.S. AIR FORCE INSTALLATION RESTORATION PROGRAM

The objective of the U.S. Air Force Installation Restoration Program (IRP) is to assess past hazardous waste disposal and spill sites at U.S. Air Force installations and to develop remedial actions consistent with the National Contingency Plan (NCP) for sites that pose a threat to human health and welfare or the environment. This section presents information on the program origins, objectives, and organization.

The 1976 Resource Conservation and Recovery Act (RCRA) is one of the primary federal laws governing the disposal of hazardous wastes. Sections 6001 and 6003 of RCRA require federal agencies to comply with local and state environmental regulations and provide information to the U.S. Environmental Protection Agency (EPA) concerning past disposal practices at federal sites. The Resource Conservation Recovery Act (RCRA) Section 3012 requires state agencies to inventory past hazardous waste disposal sites and provide information to the EPA concerning those sites.

In 1980, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (i.e., Superfund). CERCLA outlines the responsibility for identifying and remediating contaminated sites in the United States and its possessions. The CERCLA legislation identifies the EPA as the primary policy and enforcement agency regarding contaminated sites.

The 1986 Superfund Amendments and Reauthorization Act (SARA) extends the requirements of CERCLA and modifies CERCLA with respect to goals for remediation and the steps that lead to the selection of a remedial process. Under SARA, technologies that provide permanent removal or destruction of a contaminant are preferable to action that only contains or isolates the contaminant. SARA also provides for greater interaction with public and state agencies and extends the EPA's role in evaluating health risks associated with contamination. Under SARA, early determination of Applicable or Relevant and Appropriate Requirements (ARARs) is required, and the consideration of potential remediation alternatives is recommended at the initiation of an RI/FS. SARA is the primary legislation governing remedial action at past hazardous waste disposal sites.

Executive Order 12580, adopted in 1987, gave various federal agencies, including the Department of Defense (DoD), the responsibility to act as lead agencies for conducting investigations and implementing remediation efforts when they are the sole or co-contributor to contamination on or off their properties.

To ensure compliance with CERCLA, its regulations, and Executive Order 12580, the DoD developed the IRP, under the Defense Environmental Restoration Program, to identify potentially contaminated sites, investigate these sites, and evaluate and select remedial actions for potentially contaminated facilities. The DoD issued the Defense Environmental Quality Program Policy Memorandum (DEQPPM) 80-6 regarding the IRP program in June 1980, and implemented the policies outlined in this memorandum in December 1980. The NCP was issued by EPA in 1980 to provide guidance on a process by which (1) contaminant release could be reported, (2) contamination could be identified and quantified, and (3) remedial actions could be selected. The NCP describes the responsibility of federal and state governments and those responsible for contaminant releases.

The DoD formally revised and expanded the existing IRP directives and amplified all previous directives and memoranda concerning the IRP through DEQPPM 81-5, dated 11 December 1981. The memorandum was implemented by a U.S. Air Force message dated 21 January 1982.

The IRP is the DoD's primary mechanism for response actions on U.S. Air Force installations affected by the provisions of SARA. In November 1986, in response to SARA and other EPA interim guidance, the U.S. Air Force modified the IRP to provide for a Remedial Investigation/Feasibility Study (RI/FS) program. The IRP was modified so that RI/FS studies could be conducted as parallel activities rather than serial activities. The program now includes ARAR determinations, identification and screening of technologies, and development of alternatives. The IRP may include multiple field activities and pilot studies prior to a detailed final analysis of alternatives. Over the years, requirements of the IRP have been developed and modified to ensure that DoD compliance with federal laws, such as RCRA, NCP, CERCLA, and SARA, can be met.

1.2 HISTORY OF PAST IRP WORK AT THE INSTALLATION

The prime contractor shall describe the following: (1) the installation, (2) the mission of the installation over its history as it relates to waste disposal activities, (3) a brief summary of the previous investigative activities and documentation, and (3) a brief summary of existing remedial actions.

1.3 DESCRIPTION OF CURRENT STUDY

The prime contractor shall briefly describe (in one or two pages) the currently study (1) project objectives, and (2) scoping documents.

2.0 SUMMARY OF EXISTING INFORMATION

The prime contractor shall summarize existing information from previous IRP reports and other available references and identify the source(s) of the information.

2.1 INSTALLATION ENVIRONMENTAL SETTING

The prime contractor shall summarize available information on the environmental setting of the entire installation and on the demographics of the surrounding area. Discuss, on a regional basis, geology, groundwater, surface water, air, biology and demographics as described below in Sections 2.2.2-2.2.7.

2.2 SITE-SPECIFIC ENVIRONMENTAL SETTING

The prime contractor shall summarize available information on a site or zone basis. Repeat Sections 2.2.1 through 2.2.7 for each site or zone.

2.2.1 Contaminant Sources and Contamination

The prime contractor shall describe past waste disposal practices and operations. Summarize existing information from previous studies concerning the nature and extent of site contamination. Identify all potential contaminants, if known.

2.2.2 Geology

The prime contractor shall discuss and provide maps, cross sections and block diagrams, as appropriate, of the following features of geology related to project activities: (1) geomorphology, (2) stratigraphy, lithology, structure, tectonic history, and historic seismic events, (3) soil properties--texture, organic matter content, water content, porosity, temperature, pH, cation exchange capacity, electrical conductivity, soil type, etc., and (4) soil geochemistry--background concentrations of analytes.

2.2.3 Groundwater

The prime contractor shall briefly discuss and provide maps and cross sections, as appropriate, of the following features of groundwater related to project activities: (1) identification, delineation, and classification of hydrogeologic units, (2) depth to water and its variability over time (seasonal and long-term variations), (3) aquifer characteristics such as thickness, hydraulic conductivity, storativity, transmissivity, and boundary conditions, (4) flow characteristics, such as hydraulic gradients, velocities, and variability (temporal and spatial), (5) location and discharge of springs, (6) water quality--background or naturally occurring concentrations of analytes and temporal and spatial variability of concentrations, including seasonal and pumping effects, and (7) water use and well inventory.

Emphasis should be placed on the aquifers or water-bearing zones where the potential exists for contamination

2.2.4 Surface Water

The prime contractor shall discuss and provide maps of the following characteristics of surface water related to project activities: (1) identification of streams, divides, wetlands, ponds, etc., (2) flow characteristics--velocity, discharge, seasonal variability, flood frequencies and zones, and classification as gaining or losing stream, (3) water quality--background or naturally occurring concentrations of analytes and their temporal and spatial variability, (4) water use and (5) storm water runoff and collection systems.

2.2.5 Air

The prime contractor shall discuss the following characteristics of the ambient air related to project activities: (1) climate, (2) meteorological conditions--temperature, dew point, relative humidity, precipitation, evapotranspiration (actual and potential), and seasonal variability of wind velocity (average and maximum) and predominant direction, and (3) air quality--background or naturally occurring concentrations of analytes upgradient of site and temporal and spatial variability.

2.2.6 Biology

The prime contractor shall discuss the following characteristics of the ecological environment near the site or project activities: (1) common biotic communities, (2) identification and location of threatened, endangered, or rare species, and (3) sensitive environments or critical habitats.

2.2.7 Demographics

The prime contractor shall describe (1) the population data--density and age distribution, and (2) the land use for the installation and surrounding community.

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3.0 PROJECT TASKS

The prime contractor shall describe how each task will complete or improve site characterization, the quantitative risk assessment, and analysis of no further response action planned and/or remedial alternatives.

3.1 CONCEPTUAL SITE MODEL DEVELOPMENT

The prime contractor shall summarize, in a single table, existing information about the natural conditions and contamination at each site. The column headings and information content of the table are listed in Table 3-1. Any lack of information shall be clearly identified in the table. In addition to the tabular format requested, provide a drawing of the conceptual site model, similar to Figures 3-1 and 3-2, and appropriate explanatory text. "Wiring" diagrams may also be used.

TABLE 3.1 Conceptual Site Model

Site Identification	Site Description	Background Concentrations	Contaminants and Contaminated Media	Migration Pathway	Exposed Population	Risk Estimate
See 1	See 2	See 3	See 4	See 5	See 6	See 7

Instructions for filling out the table are the following:

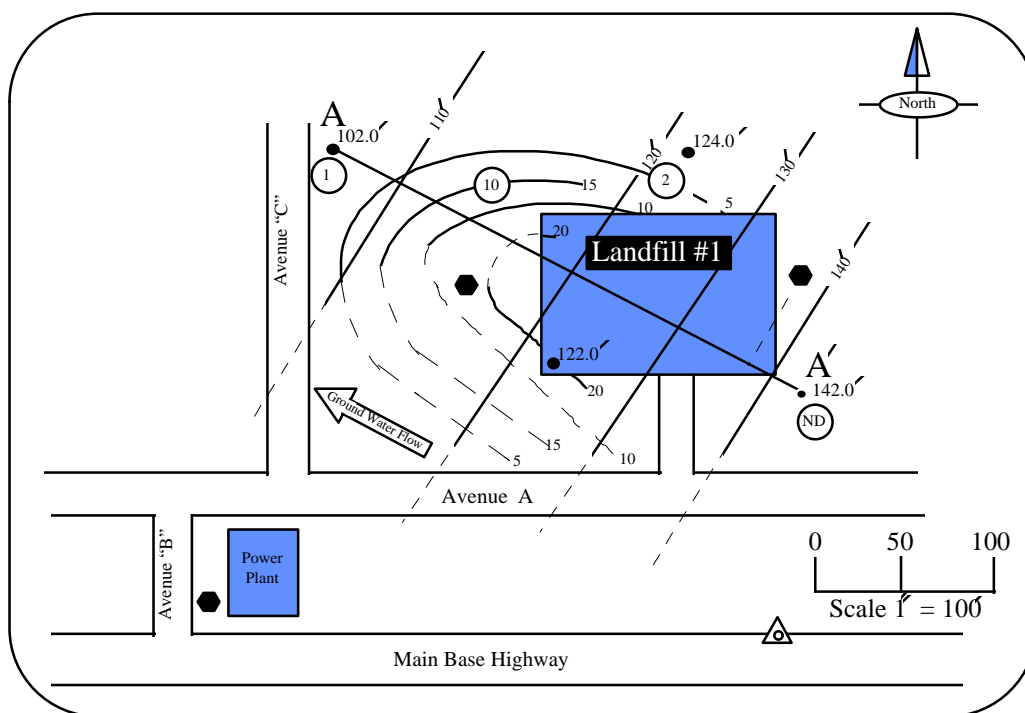
1. Provide the identification used to uniquely identify each site in the past and for the current project.
2. Briefly describe the site (e.g., fire training area, landfill, petroleum storage tank, spill area). Identify contaminant sources and amounts and geologic and hydrologic conditions. Identify if it is residential, industrial, open space, etc.
3. List background concentrations of chemicals in each medium investigated. These concentrations shall be derived from background samples associated with each site. The use of non-site specific literature values is unacceptable. Background is defined as the concentration of a chemical that would be found in a medium if the medium had not been affected by activities at the site. Provide references for obtaining background concentrations in footnotes.
4. Provide a list of analytes previously detected in environmental samples with concentrations greater than background levels that are supported by accurate and validated data and can be attributed to site activities. Identify media in which contaminants were detected (e.g., ground water, soil, sediment) and the range of concentrations found in each media.
5. Indicate whether each contaminant is expected to migrate through ground water, surface water, or air.
6. Identify the exposed human population for each exposure route: dermal, oral, and inhalation. Identify human receptors as resident, workers, recreational visitors, etc.
7. Provide a numerical estimate of the risk posed by carcinogens and noncarcinogens to the exposed population through each exposure pathway.

Remove these instructions from the final version.

Figure 3-1 Conceptual Site Model, Plan View

Site Characterization Plan View Figure, Site 2, Air Force Installation, County, State
TCE Concentrations and Groundwater Countours (Month, Year)

Data Compiled from Stage 1 PA Report Prepared on 3 Jun 92.

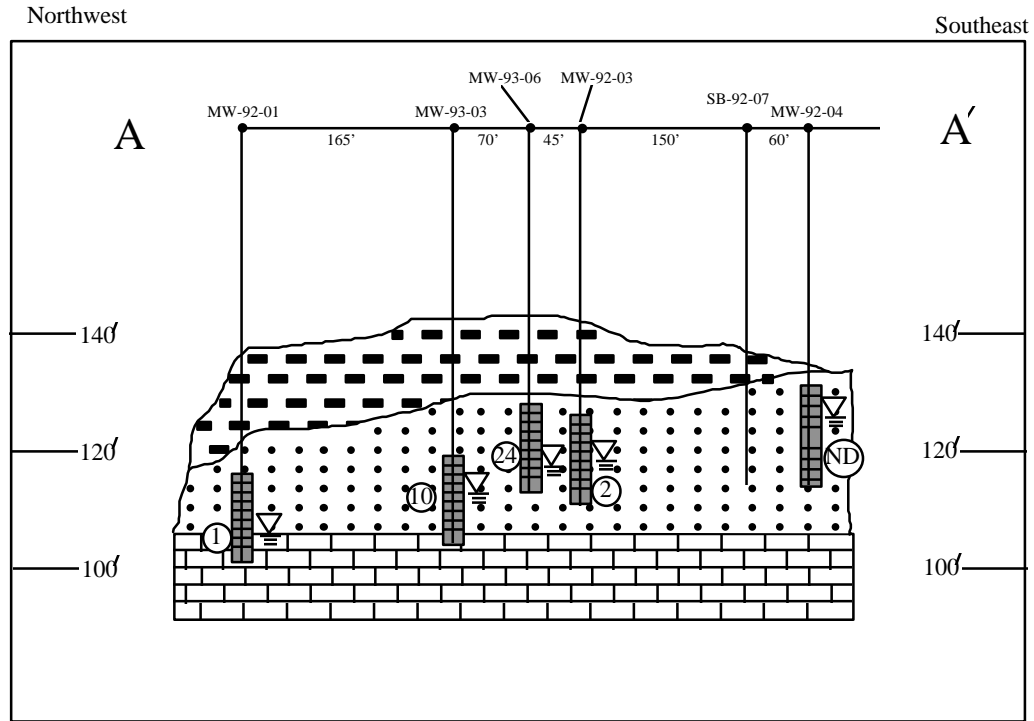


LEGEND

- | | | | |
|----------|---------------------------------------------------|----------|------------------------------------------------------------------------------------------------------|
| ● 128.0' | Well, Static Water Level, in Feet | — 130' — | Contour, Elevation in Feet, Dashed Where Approximate on Water Table Aquifer (Potentiometric Surface) |
| ● | Soil Boring | | Datum: Mean Sea Level |
| △ | Survey Contour Point (State Plane Coordinates) | — 10 — | Contour, ppb, TCE |
| A—A' | Line of Cross Section | ⊙ 24 | TCE Concentration in Ground Water (ppb) (ND = Not Detected) |
| --- | Line of Projection for Cross Section Construction | | |

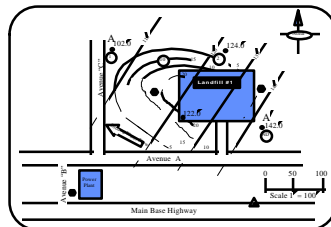
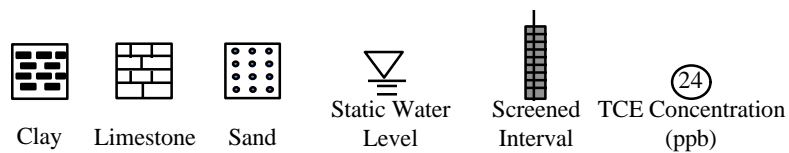
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Figure 3-2 Hydrogeologic Conceptual Site Model, Cross Section



Cross Section A-A', Site 2, Air Force Base

Legend



Location Map

Horizontal Scale 1" = 100'
 Vertical Scale 1" = 20'
 Vertical Exaggeration: 5X

3.2 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS IDENTIFICATION

The prime contractor shall identify potential contaminant-specific, location-specific, and action-specific Applicable or Relevant and Appropriate Requirements (ARARs) based on the conceptual site model and preliminary alternatives considering all federal, state, and local laws, regulations, criteria, advisories, and guidance. A tabular format is acceptable.

3.3 CHARACTERIZATION OF BACKGROUND CONDITIONS

The prime contractor shall describe existing site characterization background information/data. Discuss any background condition data gaps in the present conceptual site model and describe the proposed effort and data analysis procedures that will complete the conceptual site model.

3.4 RISK ASSESSMENT

The prime contractor shall describe how the project data will be used to determine contaminant fate and transport and to develop a risk estimate for the contamination at each site. Rationale and justification shall be supplied for each step of the process.

3.5 DATA NEEDS IDENTIFICATION

The prime contractor shall summarize the data needs identified in the conceptual site model and development of preliminary remedial action alternatives for each site and medium. Identify the data needed to characterize the site, complete the conceptual site model, better define ARARs, and perform an analysis of alternatives. The data needs shall be consistent with the project objectives and follow EPA guidance for establishing data quality objectives.

3.6 FIELD INVESTIGATION TASKS

The prime contractor shall, for the field activities required by the Statement of Work (SOW) or any other activities that will be conducted, identify the purpose of the activity, the location of the activity, and the rationale for selection of that activity and location. The prime contractor shall describe how the data quality objective process was used to develop criteria for each field task and show how identified data needs will be addressed by the proposed field activities. The prime contractor shall provide a summary table listing all field tasks to be performed at each site. Specifics of the field tasks will be presented in the Field Sampling Plan (FSP). Examples of field activities and required explanations are identified below:

3.6.1 Mobilization

The prime contractor shall itemize all tasks to be accomplished during mobilization (e.g., providing power/water to the location, designating equipment ingress/egress points, material storage, etc.)

3.6.2 Aquifer Testing

The prime contractor shall propose test designs and analytical methods to derive hydraulic properties, such as transmissivity and storativity. Possible tests include slug tests, aquifer tests, falling-head or constant-head permeability tests and analytical analyses. The design shall include locations of pumping and observation wells; the pumping discharge point; well completion diagrams; descriptions (i.e., type) of pumps, slugs, water level, and discharge measuring devices; and proposed analytical methods. Tests shall be designed to account for changes in water levels not caused by the testing.

The contractor shall propose the intended analytical methods for deriving hydraulic properties (e.g., Theis method, Jacob straight line method, or Hantush-Jacob method). The assumptions of the proposed analytical methods shall meet the hydrogeologic conceptual site model.

When effective porosity or dispersivity are to be determined in the field, the contractor shall propose tracer test designs and methods of analyzing test data. The design shall describe the tracers (e.g., dyes, salts) and the instruments for measuring tracer concentrations.

3.6.3 Geophysical Surveys

The prime contractor shall, for each geophysical method used at each site, summarize the following: (1) statement of the problem to be solved and how the chosen geophysical method addresses that problem, (2) depth of investigation provided by chosen method, specific instrumentation, and survey spacing, (3) lateral resolution capabilities of the chosen method, specific instrumentation, and survey spacing.

3.6.4 Sampling and Analysis Activities

The prime contractor shall provide a summary table of samples and analyses to be performed for each site. Include number of samples for each matrix, type and number of analyses by analytical method for each sample, and field quality assurance/quality control (QA/QC) samples.

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4.0 REMEDIAL ACTION

The prime contractor shall identify recommended remedial actions and interim remedial actions implemented at each site covered by the work plan.

4.1 REMEDIAL ACTION OBJECTIVES

The prime contractor shall identify potential remedial action objectives for each site and each medium based on the conceptual site model. The level of detail shall be consistent with the available data.

4.2 REMEDIAL ALTERNATIVES

The prime contractor shall identify a preliminary list of proven and available technical alternatives and associated technologies based upon the initially identified routes of exposure and receptors from the conceptual site model. Identify data needs for a technical evaluation of the alternatives and potential treatability studies that may be needed. Include a discussion of how the AFCEE remediation technologies matrix was used.

4.3 BENCH SCALE/TREATABILITY STUDIES

The prime contractor shall describe any studies that will be conducted.

4.4 DETAILED ANALYSIS OF ALTERNATIVES

The prime contractor shall include this section only if a feasibility study is required. Describe the process that will be used to conduct a detailed analysis of alternative remedial actions and to identify a recommended alternative.

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5.0 DATA ASSESSMENT, RECORDS, AND REPORTING REQUIREMENTS

5.1 DATA ASSESSMENT

The prime contractor shall describe how project data will be assessed and analyzed to identify accurate and valid data and to refine site models.

5.2 RECORD KEEPING

The prime contractor shall identify and provide examples of the general records of field and laboratory activities that will be maintained to document the project, or provide the reference where the example records are located in the FSP.

5.3 REPORTING REQUIREMENTS

The prime contractor shall describe the content and preparation of each of the documents required by the SOW.

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6.0 PROJECT SCHEDULE AND REFERENCES

*The prime contractor shall provide a project schedule showing milestones and deliverables.
In addition, all references shall be identified.*

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